

ABSTRACT OF THE DISCLOSURE

A fixed abrasive tool incorporating nanodiamond particles is described and disclosed. A fixed abrasive tool can include a polishing layer on a substrate. The polishing
5 layer can include an organic matrix with nanodiamond particles therein. The polishing layer can be formed in a wide variety of configurations, depending on the specific polishing application. Most often, the polishing layer can include a plurality of projections which can have a wide variety of configurations in order to achieve a particular polishing performance. Nanodiamond particles used in the present invention can have a particle size
10 from about 1 nm to about 50 nm, and preferably about 2 nm to about 10 nm. Optionally, the nanodiamond particles can include a carbonaceous coating. Such fixed abrasive tools can be formed by screen printing of a slurry of nanodiamond particles and an organic binder to form a predetermined three-dimensional pattern. Other methods can also be used to form the disclosed nanodiamond fixed abrasive tools. These fixed abrasive tools are
15 particularly suitable for polishing expensive workpieces such as silicon wafers, integrated circuitry, gemstones, and hard drive platters.